IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	KERR, Gordon; PILLAR, John, F.; LENGACHER, Allen, W.
Serial No.:	09/995,697
Filed:	November 29, 2001
Title:	STREAM PROCESSING NODE
Group:	2157
Examiner:	EL CHANTI, Hussein A
Attorney Ref.:	PAT 2678-2 US

September 29, 2006

APPEAL BRIEF

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Applicant submits the following Appeal Brief pursuant to 37 C.F.R. § 41.37 for consideration by the Board of Patent Appeals and Interferences. **The Commissioner is hereby authorized to debit $500.00 from Deposit Account No. 501593, in the name of Borden Ladner Gervais LLP, representing the fees for filing the opening brief as required by 37 C.F.R. §41.20(b).** The Commissioner is hereby authorized to charge any additional fees, and credit any over payments to Deposit Account No. 501593, in the name of Borden Ladner Gervais LLP. A duplicate copy of the Fee Transmittal is enclosed for this purpose.

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I. REAL PARTY IN INTEREST

The real party in interest is the assignee, Nortel Networks Limited.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to the appellants, the appellants' legal representative, or assignee, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-30 and 32-39 are pending and rejected under 35 U.S.C. 102(e) as being anticipated by Vahalia et al., U.S. Patent No. 5,933,603 (referred to hereafter as Vahalia).

IV. STATUS OF AMENDMENTS

No Claim Amendments were made after the final rejection.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The claims of the present application all relate to processing data streams. In particular, the claims are directed to apparatus for processing streams, a stream switch for directing a data stream within a packet network, and methods for processing a data stream. Embodiments of the invention relate to a node in a network which receives packets of data, produces properly ordered substreams of a data stream[1] carried by the received packets, and processes the substreams. This processing of substreams allows, for example, for a content switch to switch streams based on content, rather that switching each packet individually.

Claim 30

We will start our summary of independent claims with claim 30.

Independent claim 30 is directed to a stream switch, and is reproduced for ease of reference:

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[1] "A stream is a series of bytes transferred from one application to another and stream-oriented applications create or manipulate data as streams of bytes. In the case of a stream being transmitted within a packet switched network, the stream of data is divided and transmitted via a flow of packets, a flow of packets being a bidirectional set of packets going between two end points within two end stations…It is noted that it is possible for packet switched networks to mis-order and/or lose packets". (page 2, lines 7-12 and lines 19-20).

30. A stream switch for directing, within a packet switched network, a data stream, the stream switch comprising:

an interface, arranged to be coupled to the packet switched network, that operates to receive and process a flow of data packets from the packet switched network, each of the data packets representing at least one segmented portion of the data stream, and to output properly ordered substreams of the data stream;

a stream fabric that operates to receive the substreams from the interface and store the substreams within a stream queue associated with the data stream; and

a content processing element that operates to receive a copy of at least a portion of the data within the stream queue, process contents of the data received from the stream queue and instruct the stream fabric to direct the data within the stream queue to a selected flow of packets within the packet switched network, via the interface, in response to the processing of the contents of the data.

Claim 30 can best be understood by reference to an embodiment of the invention as illustrated in Diagram 1 (which is figure 7 of the present application).

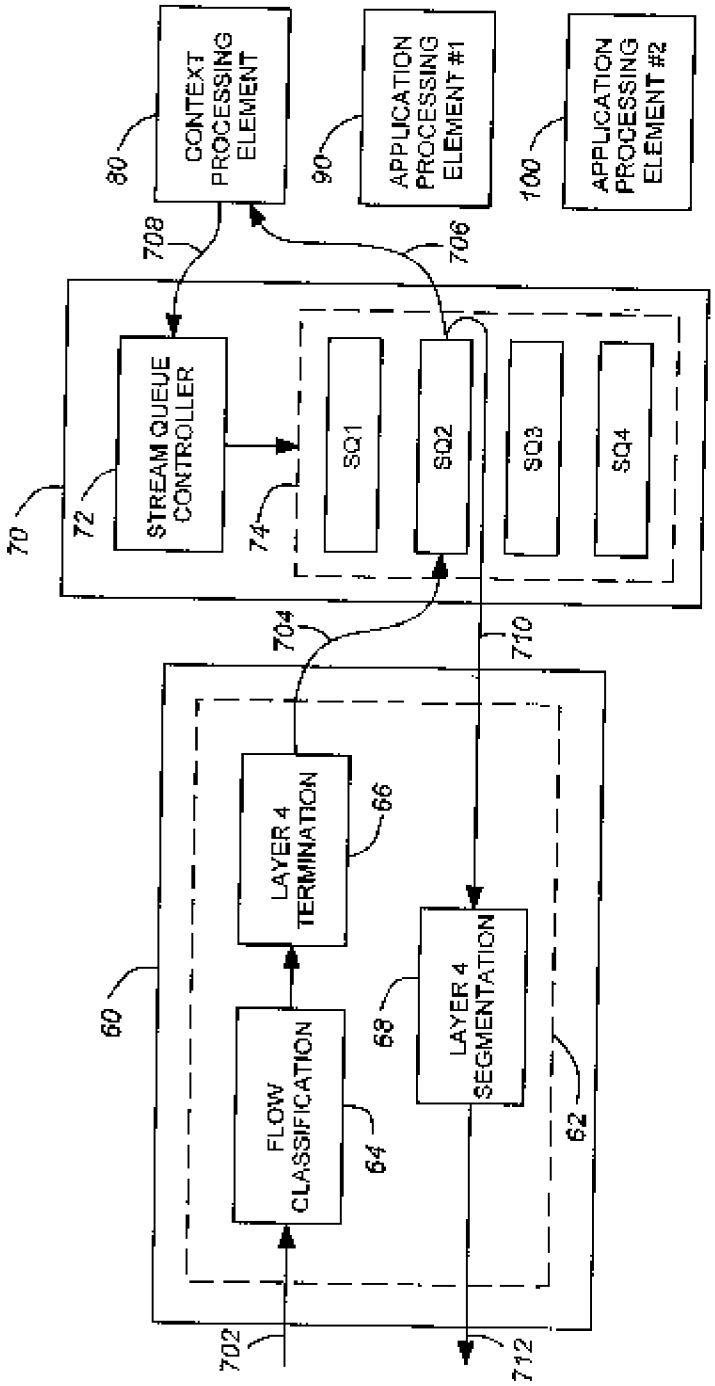
CONTEXT PROCESSING ELEMENT
80
APPLICATION PROCESSING ELEMENT #1
90
APPLICATION PROCESSING ELEMENT #2
100
708
706
STREAM QUEUE CONTROLLER
72
70
74
SQ1
SQ2
SQ3
SQ4
704
710
LAYER 4 TERMINATION
66
60
LAYER 4 SEGMENTATION
68
FLOW CLASSIFICATION
64
62
702
712

FIG. 7

A condensed summary of Figure 7 is set out below by quoting from page 15, lines 21-25, from page 16 line 28 to page 17 line 3, and from page 19 lines 5-21 of the present application:

> "As illustrated in Figure 7, a flow of data packets, as indicated by signal 702, is received at the I/O element 60 and a series of substreams of the data stream contained within the received data packets is subsequently output to a stream queue (in this case SQ2) within the stream fabric 70 as indicated by signal 704. In this case, the I/O element 60 is the producer of the stream queue SQ2."

> "Now returning to Figure 7, the substreams 704 output from the I/O element 60 are received at a stream queue 74 (SQ2 in Figure 7). Once the data stream is at least partially received by the stream queue 74, a copy of a portion of the data within the stream queue is forwarded to the initial consumer of the stream queue as indicated by the signal 706, the initial consumer being the content processing element 80 in the scenario of Figure 7. The stream queue controller 72 then waits for instructions from the content processing element 80."

> "The particular scenario being depicted within Figure 7 is consistent with the content processing element detecting a URL within the data stream at step 410 and proceeding through steps 412, 414 and 416 of Figure 9. Therefore, as depicted in Figure 7, the result of the content processing element 80 detecting a URL within the data stream is the sending of a request for rescheduling of the stream queue SQ2 to the I/O element 60 and an indication for a pop to be initiated to the I/O element 60, as indicated by the signal 708 between the content processing element 80 and the stream queue controller 72. The result of this request is the stream queue controller changing the consumer attributes associated with the stream queue SQ2 such that the consumer rights belong to the I/O element 60. In this particular case, the producer and consumer of the

stream queue SQ2 are both the I/O element 60, though it should be understood that the content processing element could have requested the rescheduling of the stream queue to another I/O element. Next, the stream queue controller 72 initiates a pop of data from the stream queue SQ2 to the new consumer, I/O element 60 as indicated by signal 710, and the I/O element 60 consumes the data within the stream queue SQ2".

Claim 1

Claim 1 more generally claims the invention. The specification clearly does not limit the invention to a content switch, as the invention has broader application. For example, Figures 11-12 teach an embodiment useful for decryption processing. Furthermore, as stated on page 22, lines 11-20:

> "Although the present invention is primarily described herein above for an implementation within a packet switched network, it should be understood that the scope of the present invention should not be limited to this implementation. It should be noted that the present invention could be used as the basis for switches, routers, bridges, servers, firewalls, load balancers, cache farms, etc. For instance, FIG. 13 illustrates a block diagram of an alternative stream processing node to that illustrated in FIG. 6 in which the I/O element 60 is replaced by a memory cache 150."

For ease of reference, claim 1 is repeated:

> 1. An apparatus for processing data streams comprising:
>
> at least one producer of properly ordered substreams of a data stream;
>
> a plurality of potential consumers of a data stream; and
>
> a stream fabric, coupled to the producer and the potential consumers, that operates to receive the substreams from the producer, store each substream within a stream queue associated with each data stream and select one of said plurality of potential consumers and output at least a portion of the data within the stream queue to the selected consumer.

As described in accordance with an embodiment of the invention having reference to Figure 2, the stream fabric 70 includes a stream queue controller 72 and a plurality of stream queues 74 that store subsets of data streams while they await processing or transmitting (see e.g. p. 9, lines 25-28). Advantageously, such an apparatus can process data streams on a stream basis.

Claim 26

Claim 26 is an independent apparatus claim of different scope.

Without limiting the generality of the foregoing in accordance with an embodiment of the invention, the stream fabric 70 can operate as depicted in Figure 3 where the content processing element determines what to do to process the substream. The content processing element is described in accordance with an embodiment of the invention at page 11 lines 4 through 28 of the subject application. By way of example, the content processing element can decide to: consume all or a portion of the stream, add data to the stream, delete data from the data stream, change data in the data stream, redirect the right to consume the stream to another potential consumer, request more data from the stream queue or transfer data from the stream queue to another stream queue. The outcome of the decision made by the content processing element 80 is sent to the stream queue controller 72 of the stream fabric to indicate what decision was made.

Claim 32 is a method claim claiming, for example, the steps carried out by the apparatus of claim 1,
and includes steps of: producing properly ordered substreams of a data stream; storing each substream within a stream queue associated with each data stream within a switch fabric; and outputting at least a portion of the data within the stream queue to a consumer of the stream queue.

Claim 39 is a method claim which recites producing (see, e.g., step 200 in figure 3) and storing (see, e.g., step 300 in figure 3) properly ordered substreams within a stream queue, and processing (see, e.g., step 400 in figure 3) contents of at least a portion of the data within a stream queue in order to select one of a plurality of potential consumers, and

outputting (see, e.g., step 500 and 600 in figure 3) at least a portion of the data within the stream queue to the selected consumer.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Appellants contend that all elements of claims 1-30 and 32-39 are not taught or suggested by Vahalia, and consequently the anticipation rejection under 35 U.S.C. 102(e) to each of claims 1-30 and 32-39 should be withdrawn.

VII. ARGUMENTS

In summary, before addressing each claim individually, we argue that Vahalia fails to anticipate the pending claims as Vahalia fails to teach each element of any of the claims. First and foremost **Vahalia does not teach a stream fabric** when that limitation is construed through the eyes of a person of ordinary skill in the art in light of the specification as a whole (Phillips v. AWH Corp., 363 F.3d 1207 (Fed. Cir. 2004) (*en banc*)).

The Court of Appeals for the Federal Circuit has stated that "[t]o anticipate, *every element and limitation* of the claimed invention must be found in a single prior art reference, *arranged as in the claim*." (*Brown v. 3M*, 60 USPQ2d 1375, 1376 (Fed. Cir. 2001) citing *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383,58 USPQ2d 1286, 1291 (Fed. Cir. 2001); *Scripps Clinic & Research Found. v. Genentech Inc.*, 927 F.2d 1565, 18 USPQ2d 1001, 1010 (Fed. Cir. 1991) (Emphasis added). The Federal circuit has added that the anticipation determination is viewed from one of ordinary skill in the art: "There must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention." (*Scripps Clinic & Research Found. v. Genentech Inc.*, 927 F.2d 1565, 18 USPQ2d 1001, 1010 (Fed. Cir. 1991).)

Vahalia teaches a video file server for serving popular movies to viewers.

The rejections to the claims rely on Figure 16, plus the description of Figure 17 found in col. 23, line 55 to col. 24 line 62 of Vahalia. Quoting from the brief description of the drawings of Vahalia:

> FIG. 16 is a schematic diagram showing "movie-on-demand" service to numerous network clients simultaneously viewing different portions of a movie;
> FIG. 17 is a flowchart of a routine for servicing requests from network clients for "movie-on-demand" service in accordance with the schematic diagram in FIG. 16:

Figure 16 of Vahalia illustrates a method of allocating server RAM to a popular movie. In particular it illustrates a disk array 47 which provides movie content to an ICDA Cache 41, portions of which are then stored in the RAM for a plurality of stream server PCs (91, 92, 93 and 94) which in turn serve portions of a movie to network clients 1-4, 5-8, 9-12 and 13-16.

Quoting from column 24, line 64 to column 25, line 4:

> "As described above with reference to FIGS. 16 and 17, a set of RAM windows in the RAM 91, 92, 93, 94 of the **stream server PCs (21 in FIG. 2)** are allocated and loaded with the data for each popular movie **before the client requests for the movie are received**, so that when a client request for the movie is received, the client can be immediately supplied with a video stream starting at any desired time or position in the movie." (emphasis added)

In these sections, Vahalia teaches a control server receiving a request, evaluating the request and then allocating the contents of the appropriate RAM to satisfy the request. (see col. 6, lines 24-38).

Neither the cited passages, nor Vahalia in general, teach, suggest or mention any type of fabric.

According to Newton's Telecom Dictionary (15th edition, 1999) a fabric is defined as follows: "A descriptive term referring to the physical structure of a switch or network. Much like a piece of cloth , physical/logical communications channels (threads) are interwoven from port-to-port (end-to-end). Ideally, data are transferred through this switch or network on a seamless basis. In ATM and Fibre Channel, the switching fabric generally is non-blocking, or virtually so, from

port-to-port. In the Internet, data works its way through a complex, and even unpredictable, interwoven network of networks comprising transmission facilities, packet switches and multiple carriers."

In our reply to the final action, dated April 28, 2006, we enclosed a copy of Technologies and Building Blocks for Fast Packet Forwarding, Werner Bux, Wolfgang E. Denzel, Ton Engbersen, Andreas Herkersdorf, and Ronald P. Luijten, IBM Research, IEEE Communications Magazine, January 2001 that described switch fabrics as follows:

> "Switch fabrics serve to interconnect the various functional units of a switch or router, in particular network and system processors (Fig. 1). The two basic functions of a packet switch fabric are the spatial transfer (switching) of packets from their incoming ports to the destination ports and the buffering of packets to resolve contention."

As implied by the Newton's Telecom Dictionary definition recited above, the woven material metaphor implied by the term is due to the often complex and web-like structure of switching paths and ports within a node.

In the "Response to arguments" on page 11 of the final action, the Examiner asserts that "the controller server …(see col. 23 lines 55-col. 24 lines 25)…*inherently* has a **switch fabric**…and therefore meets the scope of the claimed limitation…" (emphasis added)

To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. " In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original).

The Final Action does not provide any basis in fact and/or technical reasoning to reasonably support the determination that a controller server PC necessarily includes a switch fabric, as

asserted. In fact, the stream server PC taught in Vahalia uses a "bus" architecture. This is clear from the following portion of the very section cited by the examiner (emphasis added):

> "In general, a stream server PC has a total buffer memory capacity limitation and a number of bandwidth limitations. The bandwidth limitations include a network bandwidth limitation, a throughput or buffer bandwidth limitation, and a bus bandwidth limitation for communication with the ICDA 23 and the tape silo 34. The throughput or buffer bandwidth limitation is **dependent on the type of bus used in the stream server PC.** (Column 24, lines13-20)"

Column 5 of the Vahalia reference explicitly states that both the stream servers 21, and the controller servers 28 ,29 are **high-end commodity computers** which include an Intel processor connected to a EISA or PCI **bus** (see col. 5, lines 29-34, and lines 58-60).[2]

Newton's Telecom Dictionary (15th edition, 1999) defines a "bus" as:

> "An electrical connection which allows two or more wires or lines to be connected together. Typically, all circuit cards receive the same information that is put on the Bus. Only the card the information is "addressed" to will use that data. This is convenient so that a circuit may be plugged in "anywhere on the Bus." There are two common buses inside a PC – the older ISA bus, capable of only five megabytes per second and the newer PCI bus, capable of transmitting up to 132 megabytes per second. All computers and most telephone systems use buses of some type. Computer buses are typically open. Telephone system buses are typically closed. See also BACKPLANE and BUS NETWORK." (emphasis added)

A bus is not a switch fabric. Accordingly, Vahalia describes stream/controller server PCs, which use a bus. These server PCs do not include a fabric, which is an element of each of

[2] Each of the stream servers 21 is a **high-end commodity computer**, providing the highest performance appropriate for a stream server at the lowest cost…. Each of the stream servers 21, for example, includes an Intel processor connected to a EISA or PCI **bus** and at least 64 MB of random-access memory… The **controller servers** 28, 29 shown in FIG. 2 are dual redundant computers 28, 29, each of which is **similar to each of the stream servers 21. (extracts from col 5, lines 29-60, emphasis added)**

claims 1-30 and 32-38. Thus Vahalia fails to teach or suggest each and every element of the rejected claims, and the rejections to these claims under 35. U.S.C. s 102(e) should be withdrawn.

Furthermore, a controller server PC as taught by Vahalia does not inherently have a switch fabric, as asserted by the Examiner. In any event, the Examiner has failed to satisfy his burden of providing a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. Thus, for this reason as well, the rejections to the claims under 35. U.S.C. s 102(e) should be withdrawn.

In addition, the appellant makes the following arguments for each claim individually.

Claim 1

In addition to not teaching a fabric, Vahalia does not teach, and the control server PC of the cited section does not inherently have, a **stream fabric** as claimed. Without limiting the generality of the forgoing, the server of Vahalia does not include "a stream fabric, coupled to the producer and the potential consumers, that operates to receive the substreams from the producer, store each substream within a stream queue associated with each data stream and select one of said plurality of potential consumers and output at least a portion of the data within the stream queue to the selected consumer" as claimed.

Even if the server in Vahalia has a packet switch fabric, which is not admitted, Vahalia does not teach or suggest the use of, or inherently include, a stream fabric which operates on streams rather than conventional packets. Thus claim 1 can not be anticipated by Vahalia, for the reasons set out above, as at least one claim limitation is not taught or suggested by Vahalia.

Thus Vahalia fails to teach or suggest each and every element of the claim 1, and the rejections to claim 1 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 2

The rejection provides no additional analysis or details setting out how Vahalia is supposed to teach the subject matter of this claim, apart from asserting that Vahalia teaches the claimed

subject matter and stating "(see col. 23 lines 55-col. 24 lines 62)".[3] The cited passage discusses, with reference to FIG. 17, a procedure used in the admission control program for servicing client requests from the network and implementing an admission policy for client requests for a popular movie. It teaches determining whether the request is for a popular movie stored in stream server RAM, and then selecting a stream server PC to satisfy the request.

By contrast, claim 2 specifies that the stream fabric selects a consumer of the stream queue by reading a **consumer attribute for the stream queue**. This is simply not taught in the cited passage (or in Vahalia generally). Even if Vahalia does store "each substream with a stream queue" as claimed (which is not admitted), Vahalia teaches selecting the stream queue based on the content of the request (i.e., the consumer), and not on the basis of a consumer attribute for the stream queue as claimed.
Thus Vahalia fails to teach or suggest each and every element of the claim 2, and the rejections to claim 2 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 3
Similarly, the rejection of claim 3 effectively reads: Vahalia teaches claim 3 (see col. 23 lines 55-col. 24 lines 62).

Claim 3 specifies that the stream fabric selects a consumer of the stream queue based on a predetermined criteria. Once again the cited passage teaches selecting a stream server to satisfy a client request, based on whether the stream server can satisfy the request. In contrast, claim 3 claims **selecting a consumer** based on a predetermined criteria, which is clearly not taught either by the cited passage or Vahalia generally.
Thus Vahalia fails to teach or suggest each and every element of the claim 3, and the rejections to claim 3 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 4
The rejection of claim 4 is based on (col. 11, lines 22-30) of Vahalia. Appellants concede this passage does include the term "round robin". Apart from including those words, it is submitted that the passage is simply irrelevant to the claimed subject matter. The passage states "real-time and general purpose tasks are scheduled using the weighted round robin scheme".

[3] see page 3 of the Final Action, dated 02/23/2006

Further down in column 11, lines 60-65, it clarifies they are describing "polling" device drivers and communication stacks. This has nothing to do with the claimed subject matter of selecting *the consumer* based on a round-robin system as claimed.
Thus Vahalia fails to teach or suggest each and every element of the claim 4, and the rejections to claim 4 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 5

Claim 5 adds the limitation wherein the predetermined criteria comprises a determination of a least burdened potential consumer. Once again the rejection to claim 5 provides no additional analysis or details setting out how Vahalia is supposed to teach the subject matter of this claim, apart from stating "(see col. 23 lines 55-col. 24 lines 62)". Once again neither this passage nor Vahalia generally teaches the claimed subject matter. With respect to claim 1 the Examiner equates the clients (the requester of a movie) as the potential consumers. However, for any given request there is only one potential consumer in Vahalia. Accordingly, Vahalia does not teach the claimed subject matter.

Thus Vahalia fails to teach or suggest each and every element of the claim 5, and the rejections to claim 5 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 6 and 11

Similarly, the rejection to claim 6 effectively reads: Vahalia teaches claim 6 (see col. 23 lines 55-col. 24 lines 62).

In addition to the arguments made above, Vahalia certainly does not teach receiving a control signal associated with the stream queue from the consumer of the stream queue. Once again, assuming the rejection is predicated on reading the "consumer" as the requester of the movie, the consumer of Vahalia most certainly does not send a control signal associated with the stream queue to a stream fabric (even if Vahalia had one).

Thus Vahalia fails to teach or suggest each and every element of claims 6 and 11, and the rejections to claims 6 and 11 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 7

Similarly, the rejection to claim 7 effectively reads: Vahalia teaches claim 7 (see col. 23 lines 55-col. 24 lines 62).

In addition to the arguments made above, even if the consumer in Vahalia sends a control signal to stream fabric (which is denied), Vahalia does not teach or suggest having such a signal comprise an indication of at least one consumer attribute for the stream queue as claimed.

Thus Vahalia fails to teach or suggest each and every element of the claim 7, and the rejections to claim 7 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 8

The rejection to claim 8 is based on the alleged teachings of Vahalia at col. 7, line 19 - col. 8, line 23.

In addition to the arguments made above, even if the consumer in Vahalia sends a control signal to stream fabric including a consumer attribute (which is denied), Vahalia does not teach or suggest a stream fabric receiving a control signal which includes an indication of a consumer attribute which comprises the potential consumer that is selected as the consumer of the stream queue.

For example, in accordance with an embodiment of the invention a copy of a portion of the data within the stream queue is forwarded to an initial consumer of the stream queue (e.g., a content processing element 80 in the scenario of Figure 7) which can redirect the right to consume the stream to another potential consumer. Not only are such control signals not taught by Vahalia, it has no bearing on Vahalia. Even if Vahalia teaches serving the contents of a single Ram window to more than one of the network clients, it most certainly does not teach having one of those network clients redirect those contents to another network client. Thus Vahalia fails to teach or suggest each and every element of the claim 8, and the rejections to claim 8 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 9

Once again, the rejection to claim 9 effectively reads: Vahalia teaches claim 9 (see co. 23 lines 55-col. 24 lines 62). Claim 9 depends from claim 7 and recites wherein the consumer attribute comprises the number of bytes of the data within the stream queue that are to be output to the consumer of the stream queue. Not only does Vahalia fail to teach a consumer attribute as claimed in claim 7, it certainly does not teach such a consumer attribute indicating the number of the bytes to be output to the consumer.

Thus Vahalia fails to teach or suggest each and every element of the claim 9, and the rejections to claim 9 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 10

Similarly, the rejection to claim 10 effectively reads: Vahalia teaches claim 10(see col. 23 lines 55-col. 24 lines 62).

Not only does Vahalia fail to teach receive a stream fabric receiving a control signal associated with the stream queue from the consumer of the stream as argued above with respect to claim 6, it certainly does not teach such a control signal comprising an indication of at least one attribute associated with the producer of the stream queue. Vahalia does not teach having the requester of the movie send a control signal indicating an attribute associated with the ICDA, or the stream server PC, or otherwise teach the claimed limitation.

Thus Vahalia fails to teach or suggest each and every element of the claim 10, and the rejections to claim 10 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 12

Similar to the rejection to claim 11, the rejection to claim 12 effectively reads: Vahalia teaches claim 12 (see col. 23 lines 55-col. 24 lines 62 and Figures 10-16).

Not only does Vahalia fail to teach a stream fabric receiving a control signal associated with the stream queue from the consumer of the stream as argued above with respect to claim 6, Vahalia does not teach or suggest subsequently deleting the portion of the data within the stream queue which was forwarded to the consumer. Vahalia keeps the portion which is

forwarded in RAM for subsequent consumers, as Vahalia teaches a system which makes popular movies available to many requesting consumers.

Thus Vahalia fails to teach or suggest each and every element of the claim 12, and the rejections to claim 12 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 13

Similar to the rejection to claim 11 and 12, the rejection to claim 13 effectively reads: Vahalia teaches claim 13 (see col. 23 lines 55-col. 24 lines 62 and Figures 10-16).

Not only does Vahalia fail to teach receive a stream fabric receiving a control signal associated with the stream queue from the consumer of the stream as argued above with respect to claim 6, Vahalia does not teach or suggest transferring at least a portion of the data within the stream queue to another stream queue within the stream fabric, as claimed in claim 13.

Thus Vahalia fails to teach or suggest each and every element of the claim 13, and the rejections to claim 13 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 14

Similar to the rejection to claim 11 -13, the rejection to claim 14 effectively reads: Vahalia teaches claim 14 (see col. 23 lines 55-col. 24 lines 62 and Figures 10-16).

Claim 14 claims an apparatus according to claim 1, wherein the producer is an Input/Output (I/O) element arranged to be coupled to a packet switched network. We re-iterate the arguments made above regarding claim 1. In addition we point out that neither the cited passage, nor Vahalia generally, teaches or suggests the claimed limitation added in claim 14. In order to be consistent with the Examiner's assertions in claim 1, we assume the Examiner is considering the ICDA cache array in Figure 16, as the producer which produces the substreams. Even if this is the case (which is not admitted), the ICDA is not an I/O element, nor is it coupled to a packet switched network. Figure 2 of Vahalia illustrates a system in which SCSI (Small Computer System Interface) adapters are used to connect the ICDA cache array to the stream servers, and does not show a producer as an I/O element arranged to be coupled to a packet switched network as claimed.

Thus Vahalia fails to teach or suggest each and every element of claim 14, and the rejections to claim 14 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 15

Similar to the rejection to claim 11 -14, the rejection to claim 15 effectively reads: Vahalia teaches claim 15 (see col. 23 lines 55-col. 24 lines 62 and Figures 10-16).

Claim 15 claims an apparatus according to claim 14, wherein the I/O element operates to receive a flow of data packets, each of the data packets representing at least one segmented portion of the data stream; to terminate the layer 4 protocol within the received data packets; and to output properly ordered substreams of the data stream to the stream queue associated with the data stream.

We re-iterate the arguments made above regarding claim 14. In addition we point out that the SCSI adapters do not, and can not satisfy the claim limitation of receiving a flow of data packets, each of the data packets representing at least one segmented portion of the data stream and terminating the layer 4 protocol within the received data packets. Thus Applicant submits that the Vahalia disclosure does not teach or suggest the subject matter recited in claim15. Therefore, appellant respectfully requests the Appeal Board reconsider and withdraw the rejection to claim 15 for the foregoing reasons.

Claim 16

Similar to the rejection to claim 11 -15, the rejection of claim 16 effectively reads: Vahalia teaches claim 16 (see col. 23 lines 55-col. 24 lines 62 and Figures 10-16).

We re-iterate the arguments made above regarding claim 15. In addition we point out that the SCSI adapters do not, remove the packet overhead from the received data packets, reorder the data within the received data packets into the proper order if necessary and request retransmission of any lost packets if necessary. Nor does Vahalia otherwise teach or suggest the claimed limitation.

Thus Vahalia fails to teach or suggest each and every element of the claim 16, and the rejection to claim 16 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 18

Similar to the rejection to claim 11 -17, the rejection to claim 18 effectively reads: Vahalia teaches claim 18 (see col. 23 lines 55-col. 24 lines 62 and Figures 10-16).

We re-iterate the arguments made above regarding claim 1. In addition we point out Vahalia certainly fails to teach a system where the consumer of the stream queue is a content processing element that operates to receive the data output from the stream queue, nor does Vahalia teach processing contents of the data received from the stream queue and transmitting at least one control signal to the stream fabric in response to the processing of the contents of the data. Thus Vahalia fails to teach or suggest each and every element of the claim 18, and the rejections to claim 18 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 19 and 20

Similar to the rejection to claim 11 -18, the rejection to claim 19 effectively reads: Vahalia teaches claim 19 (see col. 23 lines 55-col. 24 lines 62 and Figures 10-16).

Vahalia fails to teach the subject matter of claim 19 for the reasons provided above with respect to claims 18 and 8 (and preceding claims).

Thus Vahalia fails to teach or suggest each and every element of the claim 19, and the rejections to claim 19 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 21

Similar to the rejection to claim 11 -20, the rejection to claim 21 effectively reads: Vahalia teaches claim 21 (see col. 23 lines 55-col. 24 lines 62 and Figures 10-16).

In addition to re-iterating the arguments made above, we note that Vahalia does not even mention decryption at all, nor does a key word search even reveal the partial word “decrypt”. Clearly Vahalia fails to teach or suggest the an apparatus according to claim 20, wherein the application processing element comprises an decryption processing element that operates to decrypt the data received from the stream queue and output the decrypted data to a second stream queue within the stream fabric.

Claim 22

Similar to the rejection to claim 11 -21, the rejection to claim 22 effectively reads: Vahalia teaches claim 22 (see col. 23 lines 55-col. 24 lines 62 and Figures 10-16).

Vahalia fails to teach the subject matter of claim 22 for the reasons provided above with respect to claims 18 and 8 (and preceding claims).

Thus Vahalia fails to teach or suggest each and every element of the claim 22, and the rejections to claim 22 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 23

Similar to the rejection to claim 11 -22, the rejection to claim 23 effectively reads: Vahalia teaches claim 23 (see col. 23 lines 55-col. 24 lines 62 and Figures 10-16).

It does not, in part for the reasons set out above, and also because the additional limitation added in claim 23 is not taught or suggested in the cited passages, or Vahalia generally. Without limiting the generality of the foregoing, Vahalia fails to teach any of the following highlighted portions of claim 23:

> 23. An apparatus according to claim 22, wherein, prior to the content processing element operating to transmit the control signal to the stream fabric, the content processing element further operates to add a flow context identifier to the stream queue associated with the data stream, the flow context identifier being used by the I/O element to select a flow within the packet switched network to output the data within the stream queue on.

Thus Vahalia fails to teach or suggest each and every element of the claim 23, and the rejections to claim 23 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 24

Similar to the rejection to claim 11 -23, the rejection to claim 24 effectively reads: Vahalia teaches claim 24 (see col. 23 lines 55-col. 24 lines 62 and Figures 10-16).

We reiterate our arguments made above and state Vahalia fails to teach or suggest each and every element of the claim 24, and the rejections to claim 24 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 25

Similar to the rejection to claim 11 -24, the rejection to claim 25 effectively reads: Vahalia teaches claim 25 (see col. 23 lines 55-col. 24 lines 62 and Figures 10-16).

We reiterate our arguments made above regarding claim 1and state for the record that Vahalia fails to teach or suggest having the producer and one of the potential consumers be the same.

Thus Vahalia fails to teach or suggest each and every element of the claim 25, and the rejections to claim 25 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 26

For ease of reference we set out claim 26:

> 26. An apparatus for processing streams of data comprising:
>
> at least one producer of properly ordered substreams of a data stream;
>
> a content processing element; and
>
> a stream fabric, coupled to the producer and the content processing element, that operates to receive the substreams from the producer, store the substreams within a stream queue associated with the data stream and copy at least a portion of the data within the stream queue to the content processing element;
>
> wherein the content processing element operates to receive the data output from the stream queue, process contents of the data received from the stream queue and transmit at least one control signal to the stream fabric in response to the processing of the contents of the data.

Similar to the rejection to claim 11 -25, the rejection to claim 26 effectively reads: Vahalia teaches claim 26 (see col. 23 lines 55-col. 24 lines 62 and Figures 10-16), with the exception

that it also quotes Fig 1, col 4 lines 65 to col. 5 line 24 and states “the SAR engine is read as producer…” We point out that there is no SAR engine described or mentioned in Vahalia.

In any event, we re-iterate the arguments set out above with respect to Vahalia not teaching a stream fabric as claimed.

In addition we point out that neither the cited passages, nor Vahalia generally teaches a content processing element as claimed. Nothing in Vahalia teaches a content processing element that transmits at least one control signal to the stream fabric in response to the processing of the contents of the data from a stream queue.
In addition Vahalia certainly does not teach a stream fabric which copies at least a portion of the data within the stream queue to the content processing element.

Vahalia merely teaches assigning a stream server to serve a (portion of a) movie to a requesting consumer, and does not teach or suggest the claimed subject matter.

Thus Vahalia fails to teach or suggest each and every element of the claim 26, and the rejections to claim 26 under 35. U.S.C. s 102(e) should be withdrawn.

Claims 27, 28 and 29

Similar to the rejection to claim 11 -24, the rejections to claims 27, 28 and 29 effectively reads: Vahalia teaches claim 27 (see col. 23 lines 55-col. 24 lines 62 and Figures 10-16).

We reiterate our arguments made above and state Vahalia fails to teach or suggest each and every element of claims 27, 28 and 29 and the rejections to claim 27, 28 and 29 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 30

Similar to the rejection to claim 11 -24,and 27-29 the rejection to claim 30 effectively reads: Vahalia teaches claim 30 (see col. 23 lines 55-col. 24 lines 62 and Figures 10-16).

We have already summarized and discussed independent claim 30 above. Without limiting the generality of the foregoing we submit that Vahalia fails to teach **each** of the elements of claim 30.

Vahalia fails to teach or suggest the first claim element, as Vahalia does not teach an interface that receives and processes a flow of data packets from the packet switched in order to output properly ordered substreams of the data stream. As argued above, the examiner seems to indicate that the ICDA is a producer of properly ordered substreams of the data stream. Even if this is true, it is not an interface coupled to the packet switched network as claimed.

Furthermore, in additional to arguments already presented, as argued above (for example with respect to claim 26) , Vahalia does not teach a content processing element that operates to receive a copy of at least a portion of the data within the stream queue and process contents of the data received from the stream queue. In addition, Vahalia certainly does not teach a content processing element as claimed in claim 30 which instructs the stream fabric to direct the data within the stream queue to a selected flow of packets within the packet switched network, via the interface, in response to the processing of the contents of the data.

As stated above, claim 30 is directed to a stream switch, for example a content switch, for receiving streams of data and processing substreams as substreams, in order to determine how to switch the stream within a packet based network towards its final destination. Vahalia teaches nothing of the sort.

Thus Vahalia fails to teach or suggest each and every element of claim 30, and consequently, the rejections to claim 30 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 32

Vahalia fails to teach or suggest each and every element of claim 32, as Vahalia does not teach or suggest storing each substream within a stream queue associated with each data stream within a switch fabric, as argued above. Consequently, the rejections to claim 32 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 33

Claim 33 is rejected based on the assertion that, column 23 lines 55 through column 24 lines 62 and Figures 10 through 16 of Vahalia teaches the properly ordered substreams of a data stream are produced by receiving a flow of data packets, each of the data packets representing at least one segmented portion of the data stream and terminating the layer 4

protocol within the received data packets. With respect, both the cited passages of Vahalia, and Vahalia generally simply fail to teach or suggest the claimed subject matter. Not only do the cited passages fail to teach the claimed subject matter, but Vahalia actually teaches something different. Indeed Figure 2 of Vahalia illustrates SCSI adapters coupled to the server. SCSI is known in the art to mean Small Computer System Interface, and the SCSI adapters are used to connect the ICDA cache array (presumably the producer which produces the substreams, to be consistent with the Examiner's assertions in claim 1) to the stream servers. These SCSI adapters do not satisfy the claim limitation of receiving a flow of data packets, each of the data packets representing at least one segmented portion of the data stream and terminating the layer 4 protocol within the received data packets. Thus Applicant submits that Vahalia does not teach or suggest the subject matter recited in claim 33, for the reasons given above. Therefore, appellant respectfully requests the Appeal Board reconsider and withdraw the rejection to claim 33 for the foregoing reasons.

Claim 34

Similar to the rejection to claim 11 -24, and 27-33 the rejection to claim 34 effectively reads: Vahalia teaches claim 34 (see col. 23 lines 55-col. 24 lines 62 and Figures 10-16).

We re-iterate the arguments made above regarding claim 33. In addition we point out that the SCSI adapters do not, remove the packet overhead from the received data packets, reorder the data within the received data packets into the proper order if necessary and request retransmission of any lost packets if necessary. Nor does Vahalia otherwise teach or suggest the claimed limitation.

Thus Vahalia fails to teach or suggest each and every element of the claim 34, and the rejection to claim 34 under 35. U.S.C. s 102(e) should be withdrawn.

Claims 35, 36 and 38

Similar to the rejection to claim 11 -24, and 27-34 the rejection to claims 35, 36 and 38 effectively reads: Vahalia teaches the claims (see col. 23 lines 55-col. 24 lines 62 and Figures 10-16).

We re-iterate the arguments made above regarding claim 32. In addition, Vahalia fails to teach or suggest processing contents of at least a portion of the data within the stream queue,

and determining which of the potential consumers to select as the consumer for the stream queue based upon the contents of the at least a portion of the data within the stream queue and outputting at least a portion of the data within the stream queue to the selected consumer, for the similar reasons to those argued above with respect to claims 8 and 18.

Thus Vahalia fails to teach or suggest each and every element of claims 35, 36 and 38 and the rejection to claim 35, 36 and 38 under 35. U.S.C. s 102(e) should be withdrawn.

Claim 37

Similar to the rejection to claim 11 -24, and 27-36 the rejection to claim 37 effectively reads: Vahalia teaches claim 37 (see col. 23 lines 55-col. 24 lines 62 and Figures 10-16).

We re-iterate the arguments made above regarding claim 36. In addition we remind the Appeal board that Vahalia is altogether silent with respect to decryption, as argued above for claim 21. Vahalia can not possibly anticipate this claim, as the entire reference is completely irrelevant to the claimed subject matter.

Thus Vahalia fails to teach or suggest each and every element of the claim 37, and the rejection to claim 37under 35. U.S.C. s 102(e) should be withdrawn.

Claim 39

Similar to the rejection to claim 11 -24, and 27-33 the rejection to claim 39 effectively reads: Vahalia teaches claim 39 (see col. 23 lines 55-col. 24 lines 62 and Figures 10-16).

We note that claim 39 does not explicitly recite a fabric. However Vahalia still fails to anticipate the claim, as Vahalia fails to teach or suggest processing contents within at least a portion of the data within the stream queue to determine one of a plurality of potential consumers to select as a consumer of the stream queue as claimed. Neither the cited passage, nor Vahalia generally, teaches or suggests processing the contents of the stream queue *itself* in order to determine which of several potential consumers should receive the contents of the stream queue. The portions of the movie stored in the stream server PCs are not processed to determine which of several potential consumers should receive them.

As far as we understand the rejection, we believe the examiner is equating the IDCA cache 41 as a producer, the network clients as consumers and the stream server PC RAM 91-94 as stream queues. Even if this is the case (which is not admitted), Vahalia still does not teach the claimed method. Claim 39 recites, in part, selecting a consumer (from a plurality of potential consumers) and outputs stream queue contents to the selected consumer. Vahalia, to the extent it is even relevant, does not satisfy this limitation. As clearly stated in col. 6, lines 24-26 the control server *assigns one of the stream servers to the requesting consumer*. In other words it selects the stored data to satisfy the consumer request. In contrast Claim 39 claims a method which selects a consumer from a plurality of consumers to output the data based on processing contents within at least a portion of the data within the stream queue. Thus Vahalia teaches a system which operates in a different manner than the claimed subject matter and does not teach all of the elements of the claim.

Thus Vahalia fails to teach or suggest each and every element of the claim 39, and the rejection to claim 39 under 35. U.S.C. s 102(e) should be withdrawn.

VIII. CONCLUSION

Applicant respectfully requests that the Board enter a decision overturning the Examiner's rejection of all pending claims, and holding that the claims are not anticipated by the prior art.

Respectfully submitted,

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IX. CLAIMS APPENDIX

1.(previously presented) An apparatus for processing data streams comprising:

at least one producer of properly ordered substreams of a data stream;

a plurality of potential consumers of a data stream; and

a stream fabric, coupled to the producer and the potential consumers, that operates to receive the substreams from the producer, store each substream within a stream queue associated with each data stream and select one of said plurality of potential consumers and output at least a portion of the data within the stream queue to the selected consumer.

2.(previously presented) An apparatus according to claim 1, wherein the stream fabric operates to select a consumer of the stream queue by reading a consumer attribute for the stream queue.

3.(previously presented) An apparatus according to claim 1, wherein the stream fabric operates to select one of the potential consumers as a consumer for the stream queue based upon a predetermined criteria.

4.(original) An apparatus according to claim 3, wherein the predetermined criteria comprises a round robin system.

5.(original)An apparatus according to claim 3, wherein the predetermined criteria comprises a determination of a least burdened potential consumer.

6. (original) An apparatus according to claim 1, wherein the stream fabric further operates to receive a control signal associated with the stream queue from the consumer of the stream queue.

7. (original) An apparatus according to claim 6, wherein the control signal comprises an indication of at least one consumer attribute for the stream queue.

8. (previously presented) An apparatus according to claim 7, wherein the consumer attribute comprises the potential consumer that is selected as the consumer of the stream queue.

9. (original) An apparatus according to claim 7, wherein the consumer attribute comprises the number of bytes of the data within the stream queue that are to be output to the consumer of the stream queue.

10. (original) An apparatus according to claim 6, wherein the control signal comprises an indication of at least one attribute associated with the producer of the stream queue.

11. (original) An apparatus according to claim 6, wherein the control signal comprises an instruction to copy at least a portion of the data within the stream queue to the consumer of the stream queue.

12. (original) An apparatus according to claim 6, wherein the control signal comprises an instruction to forward at least a portion of the data within the stream queue to the consumer of the stream queue and to subsequently delete the portion of the data within the stream queue.

13. (original) An apparatus according to claim 6, wherein the control signal comprises an instruction to transfer at least a portion of the data within the stream queue to another stream queue within the stream fabric.

14. (original) An apparatus according to claim 1, wherein the producer is an Input/Output (I/O) element arranged to be coupled to a packet switched network.

15. (original) An apparatus according to claim 14, wherein the I/O element operates to receive a flow of data packets, each of the data packets representing at least one segmented portion of the data stream; to terminate the layer 4 protocol within the received data packets; and to output properly ordered substreams of the data stream to the stream queue associated with the data stream.

16. (original) An apparatus according to claim 15, wherein the I/O element operating to terminate the layer 4 protocol within the received data packets comprises removing the packet overhead from the received data packets, reordering the data within the received data packets into the proper order if necessary and requesting retransmission of any lost packets if necessary.

17. (previously presented) An apparatus according to claim 1, wherein at least one of the said plurality of potential consumers is a processing element.

18. (original) An apparatus according to claim 17, wherein the consumer of the stream queue is a content processing element that operates to receive the data output from the stream queue, process contents of the data received from the stream queue and transmit at least one control signal to the stream fabric in response to the processing of the contents of the data.

19. (original) An apparatus according to claim 18, wherein the at least one control signal comprises an instruction to change a consumer attribute of the stream queue such that the consumer of the stream queue is changed to another one of the potential consumers.

20. (original) An apparatus according to claim 19, wherein the other one of the potential consumers comprises an application processing element that operates to process the contents of the data received from the stream queue.

21. (original) An apparatus according to claim 20, wherein the application processing element comprises an decryption processing element that operates to decrypt the data received from the stream queue and output the decrypted data to a second stream queue within the stream fabric.

22. (original) An apparatus according to claim 19, wherein the other one of the potential consumers comprises an Input/Output (I/O) element coupled to a packet switched network, the I/O element operating to output the data within the stream queue to the packet switched network.

23. (original) An apparatus according to claim 22, wherein, prior to the content processing element operating to transmit the control signal to the stream fabric, the content processing element further operates to add a flow context identifier to the stream queue associated with the data stream, the flow context identifier being used by the I/O element to select a flow within the packet switched network to output the data within the stream queue on.

24. (original) An apparatus according to claim 18, wherein the stream fabric comprises a plurality of stream queues and the content processing element is set as a default initial consumer of each of the stream queues within the stream fabric.

25. (original) An apparatus according to claim 1, wherein the producer and one of the potential consumers are the same component.

26. (original) An apparatus for processing streams of data comprising:

at least one producer of properly ordered substreams of a data stream;

a content processing element; and

a stream fabric, coupled to the producer and the content processing element, that operates to receive the substreams from the producer, store the substreams within a stream queue associated with the data stream and copy at least a portion of the data within the stream queue to the content processing element;

wherein the content processing element operates to receive the data output from the stream queue, process contents of the data received from the stream queue and transmit at least one control signal to the stream fabric in response to the processing of the contents of the data.

27. (original) An apparatus according to claim 26 further comprising at least one consumer of a data stream; and

wherein the at least one control signal comprises an instruction for the stream fabric to forward further data from the stream queue to the consumer.

28. (original) An apparatus according to claim 27, wherein the consumer comprises an application processing element that operates to process the contents of the data received from the stream queue.

29. (original) An apparatus according to claim 27, wherein the consumer comprises an Input/Output (I/O) element coupled to a packet switched network, the I/O element operating to output the data within the stream queue to the packet switched network.

30. (original) A stream switch for directing, within a packet switched network, a data stream, the stream switch comprising:

an interface, arranged to be coupled to the packet switched network, that operates to receive and process a flow of data packets from the packet switched network, each of the data packets representing at least one segmented portion of the data stream, and to output properly ordered substreams of the data stream;

a stream fabric that operates to receive the substreams from the interface and store the substreams within a stream queue associated with the data stream; and

a content processing element that operates to receive a copy of at least a portion of the data within the stream queue, process contents of the data received from the stream queue and instruct the stream fabric to direct the data within the stream queue to a selected flow of packets within the packet switched network, via the interface, in response to the processing of the contents of the data.

31. (canceled)

32. (previously presented) A method of processing a data stream comprising:

producing properly ordered substreams of a data stream;

storing each substream within a stream queue associated with each data stream within a switch fabric; and

outputting at least a portion of the data within the stream queue to a consumer of the stream queue, the consumer being one of a plurality of potential consumers.

33. (original) A method according to claim 32, wherein the producing properly order substreams of a data stream comprises receiving a flow of data packets, each of the data packets representing at least one segmented portion of the data stream; and terminating the layer 4 protocol within the received data packets.

34. (original) A method according to claim 33, wherein the terminating the layer 4 protocol within the received data packets comprises removing the packet overhead from the received data packets, reordering the data within the received data packets into the proper order if necessary and requesting retransmission of any lost packets if necessary.

35.(original) A method according to claim 32, wherein the outputting at least a portion of the data within the stream queue to a consumer of the stream queue comprises processing contents of at least a portion of the data within the stream queue, determining which of the

potential consumers to select as the consumer for the stream queue based upon the contents of the at least a portion of the data within the stream queue and outputting at least a portion of the data within the stream queue to the selected consumer.

36. (original) A method according to claim 35 further comprising processing the data received from the stream queue at the selected consumer of the stream queue.

37. (original) A method according to claim 36, wherein the processing the data received from the stream queue comprises decrypting the data received from the stream queue and storing the decrypted data within a second stream queue.

38. (original) A method according to claim 36, wherein the processing the data received from the stream queue comprises outputting the data received from the stream queue to a packet switched network.

39. (original) A method of processing a data stream comprising:

producing properly ordered substreams of a data stream;

storing the substreams within a stream queue associated with the data stream;

processing contents within at least a portion of the data within the stream queue to determine one of a plurality of potential consumers to select as a consumer of the stream queue; and

outputting at least a portion of the data within the stream queue to the selected consumer of the stream queue.

X. EVIDENCE APPENDIX

None

XI. RELATED PROCEEDINGS APPENDIX

None